PORTABLE AND FOLDABLE WET CLOTHES HANGER

MOHAMAD RUZAINI BIN MOHAMED IBRAHIM

A report submitted in partial fulfilment of the requirements
for the award of the
Diploma of Mechanical Engineering

Faculty of Mechanical Engineering
UNIVERSITI MALAYSIA PAHANG

NOVEMBER 2008

SUPERVISOR DECLARATION

I hereby declare that I have read this project report and in my opinion this project report is sufficient in terms of scope and quality for the award of the Diploma in Mechanical Engineering

Signature :
Name of Supervisor :
Date : ……..

STUDENT'S DECLARATION

I hereby declare that the work in this thesis is my own except for quotations and summaries which have been duly acknowledged. The thesis has not been accepted for any degree and is not concurently submitted for award of other degree.

….. ……

Name : MOHAMAD RUZAINI BIN MOHAMED IBRAHIM

ID Number: MB06069

Date :

DEDICATION

Firstly, I would like to show my expression to Allah s.w.t whose guidance, help and grace was instrumental in making this work become a reality. I would also like to thank my respected lecturer, Mr. Zulkifli Bin Ahmad @ Manap and all lecturers who had guide and help me a lot to complete this task.

This dedication also goes to my beloved family which is my father Mr. Mohamed Ibrahim Bin Abdul Hameed, my mother, Mrs. Latiffa Bt. Sultan and family, without then my pursuit of higher education would not have been possible. Also thanks a lot to the university administration and friends in their support and advice towards this project. Lastly, thanks to all those had help me to complete my task.

ACKNOWLEDGEMENT

I would like to express my gratitude and appreciation to all those who gave me the possibility to complete this report. Special thanks is due to my supervisor, Mr. Zulkifli Bin Ahmad @ Manap whose help, stimulating suggestions and encouragement helped me in all time of fabrication process and in writing this report. I am very grateful to him for his patience and his constructive comments that enriched this project.

I would also like to acknowledge with much appreciation the crucial role of the staff in Mechanical Laboratory, who gave me a permission to use the laboratory equipment and also the machine and giving a permission to use all the necessary tools in the laboratory.

Special thanks too go to Mr. Zamri Bin Ahmad, as the Final Year Coordinator, who has helping a lot and give some advice and share his knowledge on how to complete this task in the right way.

I also want to thank to all my friends for their support and help to complete the task and for sharing their knowledge on how to solve the problems. Finally, I thank my family for their continuous support and confidence in my efforts.

ABSTRACT

The clothes hanger is used to hang the wet clothes that are washed. Development of this portable and foldable wet clothes hanger is to create a new model of clothes hanger that is foldable and portable and to fullfill current market needs. To design and fabricated this portable and foldable clothes hanger, it must be compared with other product that maybe available in the market. First, get an idea from internet, magazine, newspaper or other from available data. Form there the information and idea to design and fabricated can be created. The whole project involved various method and process that usually use in engineering such as concept design, analysis process and lastly fabrication process.

This portable and foldable wet clothes hanger is made from aluminium. The height of this hanger can be adjusted according to users taste. It also can be easily moved because of its size and weight. When it is not used, it can be folded and only needed small place to store. Overall from this project, time management and discipline is important to make sure this project goes smooth as plan and done at correct time.

ABSTRAK

Ampaian baju digunakan untuk menyidai pakaian basah yang telah dibasuh.Penghasilan ampaian yang mudah dibawa dan boleh dilipat ini adalah untuk mencipta model terbaru ampaian yang boleh lipat dan mudah dibawa untuk memenuhi kehendak pasaran terkini. Untuk menreka dan menghasilkan ampaian boleh lipat dan mudah dibawa ini, ianya mesti dibandingkan dengan produk yang sedia ada dipasaran. Pertama sekali, dapatkan idea daripada internet, majalah, suratkhabar atau daipada data-data lain. Daripada maklumat yang ada, idea dan penghasilan ampaian ini boleh dilakukan. Keseluruhan projek ini merangkumi pelbagai kaedah dan proses yang biasanya digunakan di dalam kejuruteraan seperti merekacipta, analisis proses dan akhir sekali proses membina ampaian tersebut.

Ampaian boleh lipat dan mudah dibawa ini diperbuat daripada aluminium. Ketinggian ampaian ini boleh diubahsuai mengikut citarasa pengguna. Ianya juga mudah dibawa disebabkan saiz dan beratnya. Apabila tidak digunakan, ampaian ini boleh dilipat dan hanya memrlukan ruang yang kecil untuk disimpan. Secara keseluruhannya, pengurusan masa dan disipli adalah penting umtuk memastikan projek ini berjalan dengan lancar seperti yang dirancang dan dapat disiapkan pada masa yang ditetapkan.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURE

CHAPTER 1

INTRODUCTION

1.1 Project Synopsis

1.1.1 General Project Synopsis

This project was purpose to design and fabricate the portable and foldable wet clothes hanger. This project involves designing and fabricating the clothes hanger. I need to create a clothes hanger that is easy to bring anywhere and easy to store when not used because, nowadays people having problem to store and carry the clothes hanger. As the Diploma final year project allocates the duration of one semester, this project was participate by me alone to finish the clothes hanger. This project need a lot of skills such as using Solidworks , running Truma Bend V Series(bending machine), drilling machine, grinding and welding process.

The project title is “Design and fabricate a new concept of portable and foldable wet clothes hanger”. This project involves the fabrication of the clothes hanger with a specification regarding strength, material and cost. With the newly designed and fabricated this clothes hanger, tests are required to be conducted and to verify the design. Overall, this project will acquire the skill of design and fabrication.

1.2 Project Problem Statement

According to the market, the already exist clothes hanger are not suitable and comfortable. This is because the hanger is big and hard to move when raining, those who are leaving in condominium also don't have enough space to place the hanger when not used. To solve the problem, I have design a portable and foldable wet clothes hanger that is easy to use, easy to carry and stored when not used.

1.3 Project Objective

1.3.1 General objective

The purpose of this project is to practice the student to solving problem using academic research and also to gain knowledge and skill. This project is also important to train and increase the student capability to get information, research, data gathering and then solves the problem by following the procedures learned. The project also will generate students that have capability to get a good research report in thesis form or technical writing. This project also train and produce student to capable of doing work with minimal supervisory and more independent.

1.3.2 Specific Project Objective

a) Design and fabricate the portable and foldable wet clothes hanger
b) Fabricate the clothes hanger that has the aesthetic value as desired by the current market.
c) Produce the minimum cost and high quality of the clothes

1.4 Project Scope of Work

This project require precise scope of work and proper plan need to be followed because this project must through various process before it would be produce. These are scope of work in this project:

1.4.1 Literature review

The clothes hanger is used from generation to generation to hang the wet clothes. Nowadays, there are many types of clothes hanger in market with various size, function, and material.

1.4.2 Design concept

Three concept of the clothes hanger is sketched. The concept then analyzed according several criteria and specification.

1.4.3 Finalize concept

The result of the analysis used to design a new clothes hanger that fulfill all the criteria and specification. The concept improved using Solidwork software.

1.4.4 Concept fabrication

The next step is fabricating the clothes hanger using appropriate material and laboratory equipment.

1.4.1 Writing report

Report of the all processes of this project is done. The report state all the process, method used and problem encountered during making this project.

1.4.2 The product should be portable and foldable.

The product specifications are it must be portable, foldable and minimum in cost. This is to make sure the product fullfill current market needs and can compete with already exists clothes hanger.

1.5 Project Background

This clothes hanger is functioning as a product which can be used to hang the wet clothes to make it dry. The designs is improved everyday in order to give the comfortable to the users. Nowadays, people having problem with their clothes hanger because it is not portable and difficult to store it when unused. So, this portable and foldable wet clothes hanger has been designed. The design should be creative, simple, easy to use, easy to handle, portable and minimum cost. This clothes hanger only needs a small place to store it when unused. The height of this hanger is adjustable and can be folded. It is also light because it made from aluminium.

1.6 Project Schedule

Table 1.1: Gantt chart

ACTIVITIES	W	E	E	K										NOTES
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
Briefing															
Literature Review															
Idea Development															
Concept Design															
Design Analysis															
Mid Presentation															
Fabrication															
Report Writing															
Final Presentation															

According to table 1.1, the project starts with the briefing from the supervisor in week 1. Then, continued with literature review starting from week 2 until week 5. The literature review is all about gathering information about the clothes hanger.

The process continued with idea development from week 3 to week 6. On this stage, literature review is analyzed to find out the current type of clothes hanger and the current user need. From week 4 to week 7 is idea development process. On this stage, the clothes hanger is sketch into 3 types of designs. After that, the designs are analyzed and the best design is selected. This task takes time about three weeks.

On week 8, the progress of the project will be presented. After the presentation finished, the process continued with the fabrication of the design on week 9. The fabrication process takes time about 7 week to make a complete design of the portable and foldable clothes hanger.

The progress of the project continued with the report writing. This task starts from week 5. It take time about 10 weeks to finish the final project report. The last progress is the final presentation on week 14. All the task is scheduled for 14 weeks to complete the project.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Clothes hanger is used to dry the wet clothes by hanging the clothes on it. This clothes hanger was first invented in France and England in 1800. The first model of clothes hanger is using a rope that is tied on the trees. The clothes hanger nowadays comes in a wide variety of shapes, colour, height and materials depend on their origin, style and intended purpose. The clothes hanger can be freestanding, hanged or attached at wall. Some of the freestanding clothes hanger has wheel to make it easier to move. The other types of hanger can adjust the height according to user's comfortable. Others have high quality of material such as aluminium, plastics and stainless steel. Some clothes hanger is made as an art and has a high value. But nowadays, people are like to use the clothes hanger that is simple, light weight, portable and foldable.

2.2 Product Review

2.2.1 Proteam Single Clothes Hanger, Black and Chrome

Figure 2.1: Proteam single clothe hanger

The clothes hanger shown in the **figure 2.1** above is a simple design from the Proteam UK Ltd. This clothes hanger's height is adjustable and it is also portable. It is made as a simple and strong hanger and comes in a black and silver colour. The dimension of this product is height 94.5 – 166.5cm x width 81.5 cm x depth 44.5 cm.

2.2.2 Valet Double Clothes Hanger – Jeeves (Italy)

Figure 2.2: Valet double clothes hanger

The clothes hanger that shown **in figure 2.2** is made from high quality wood and has a high art value. This clothes hanger not only can used to hang clothes, but it is also a decoration accessory in our home. It has wheel so it is easy to move it. The dimension of this product is height 105.5cm x width 70.0 cm x depth 40.0 cm.

2.2.3 Mobile Wooden Clothes Hanger (UK)

Figure 2.3: Mobile wooden clothes hanger

The clothes hanger that shown in **figure 2.3** is also made of high quality wood. It is a simple clothes hanger and it's lower part can be used to put the shoes or other things. This is a product from UK. The dimension of this product is height 95.0cm x width 50.0 cm x depth 50.0 cm.

2.3 Process in fabrication

This chapter is about literature review of fabrication process such as welding, drilling, cutting and others. Before fabrication process, the material selection is crucial. The selection of joining is also important to get a product with better strength and durability.

2.3.1 Welding

Welding is a fabrication process that joins materials, usually metals or thermoplastics, by causing coalescence. This is often done by melting the work pieces and adding a filler material to form a pool of molten material that cools to become a strong joint, with pressure sometimes used in conjunction with heat, or by itself, to produce the weld. This is in contrast with soldering and brazing, which involve melting a lower-melting-point material between the work pieces to form a bond between them, without melting the work pieces. A weld occurs when pieces of metal are joined by causing the interface to melt and blend prior to solidifying as a uniform metal joint. This process may be caused by heat, pressure or a combination of both. When heat alone is used, the process called fusion welding.

Pressure welding usually involves heating the surfaces to a plastic state and then forcing the metal together. The heating can be by electric current of by friction resulting from moving one surface relative to the other. The methods and equipment used for welding metal are also associated with cutting metal. There are a large number of welding and allied processes including the following.

a) Basic theory of Metal Inert Gas (MIG) Welding

Gas metal arc welding (GMAW), also known as metal inert gas or MIG welding, is a semi-automatic or automatic process that uses a continuous wire feed as an electrode and an inert or semi-inert gas mixture to protect the weld from contamination. As with SMAW, reasonable operator proficiency can be achieved with modest training. Since the electrode is continuous, welding speeds are greater for GMAW than for SMAW. The clotheshanger's lower part will be joined using this MIG welding process. **Figure 2.4** show the basic structure of the MIG welding.

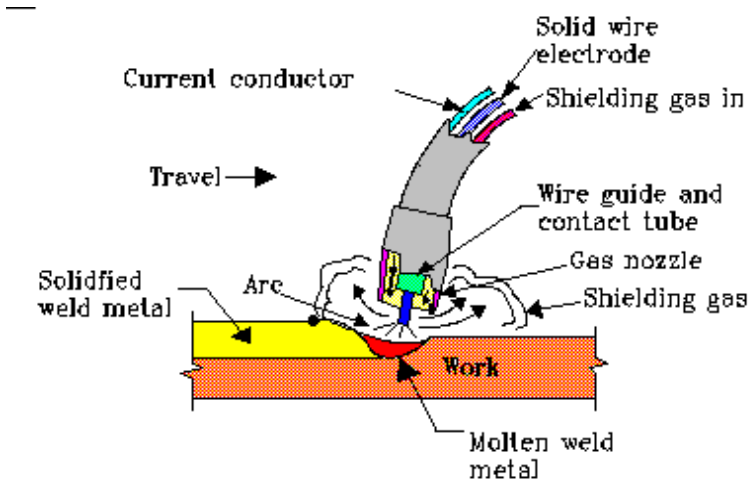

Figure 2.4: Basic structure of MIG welding